UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I
ONE CONGRESS STREET- SUITE 1100 (CPE)
BOSTON, MASSACHUSETTS 02114 - 2023

FACT SHEET

DRAFT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT TO DISCHARGE TO WATERS OF THE UNITED STATES PURSUANT TO THE CLEAN WATER ACT (CWA)

NPDES PERMIT # MA0001830

NAME AND ADDRESS OF APPLICANT:

Environmental Quality and Real Estate
Aggregate Industries, Inc.
1715 Broadway
Saugus, MA 01906

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Aggregate Industries, Inc.
30 Danvers Road
Swampscott, MA 01907

RECEIVING WATERS: Foster Pond (Outfall 001) & a wetlands system which includes Thompson's Meadow and is adjacent to Forest River (Outfall 002)

CLASSIFICATION: B

SIC CODES: 1429 (Crushed and Broken Stone), 3273 (Ready-Mixed Concrete)

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I. PROPOSED ACTION

The above named applicant has applied to the U.S. Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MassDEP) for the re-issuance of a National Pollutant Discharge Elimination System (NPDES) permit to discharge storm water, process water, and ground water into the designated receiving water. The permit, which was issued to Bardon Trimount, Inc. on April 14, 2000 (the Current Permit), became effective on May 14, 2000 and expired on May 14, 2005. EPA received a permit renewal application from Aggregate Industries (previously Bardon Trimount) on January 21, 2005. Since the permit renewal application was deemed complete by EPA, the permit has been administratively continued.

II. TYPE OF FACILITY

Aggregate Industries, Inc, located at 30 Danvers Road in Swampscott, MA, operates a rock quarry, a ready-mix concrete plant, a maintenance garage, and supporting activities at the facility. The total area of the site is 209 acres and the total excavated area is 78.46 acres. See Attachment A for the Site Plan.

The quarry operation involves the use of explosives to blast stone from the quarry walls and benches. The stone is subsequently crushed down into different sizes utilizing primary, secondary, and tertiary crushing processes. The crushed stone and sand are used either to manufacture aggregate products or sold and distributed offsite. Blasting is currently done in the quarry approximately 50 times per year using Hydromite 4400 bulk and Hydromite 860 3x9 wpp (water resistant ammonium nitrite). No blasting agents containing perchlorate are currently used onsite, and therefore the use of blasting agents containing perchlorate is prohibited in the permit. The rock fragments from blasting are fed into various crushing and processing operations, both

wet and dry, to produce a variety of construction grade aggregates (stone and sand). These aggregates are then screened, segregated, and stored according to fragment size.

The wash plant located onsite processes dry stone dust, producing about 1000 tons of stone sand per day. The plant runs approximately 14 hours/day, 5 days/week. On Saturdays, the plant operates approximately 7 hours. Approximately 80% of the stone sand produced is recovered washed stone dust. The remaining material, approximately 20%, is discharged into the wash plant settling pond which is excavated every 4-5 working days and stockpiled in two drying cells. The material is then re-excavated from the two drying cells and moved to the pond silt stockpile, as a saleable product.

Ready-Mix Concrete (RMC) plant operations involves the combination of cement, additives (e.g. slag cement or new cement), sand, coarse aggregate, admixtures, and water to form the final concrete products. There are no discharges of process water from this operation.

Aggregate historically operated a granules plant. Operations at the granules plant have ceased and Aggregate plans to dismantle the plant in the future. In the granules plant operations, manufactured sand was washed to remove chipped particles used to manufacture granules. The chipped particles were coated with mineral oil to form the crushed concrete granules product. There were no discharges of process water from the granule plant operations.

Aggregate products are sold both externally as well as used to manufacture Aggregate products. Pond silt is strictly sold to the external market. The following products are sold externally and used internally: 1½" dense grade, 1" dense grade, dust, washed stone dust, 12" stone, 2-4" stone, 1 ½" stone, ¾" stone, ½" stone, $^{3}/_{8}$" stone, ready mix concrete, T base, cold patch, and concrete blocks.

III. SUMMARY OF MONITORING DATA

A quantitative description of the discharges in terms of significant effluent parameters based on discharge monitoring reports (DMRs) submitted for Outfall 001 during the time period from July 2000 to May 2007 was reviewed and used in the development of the draft National Pollutant Discharge Elimination System (NPDES) permit (Draft Permit). A summary of the DMR data is provided in Attachment E to this Fact Sheet.

IV. PERMIT BASIS AND EXPLANATION OF EFFLUENT LIMIT DERIVATIONS

The effluent limitations, monitoring requirements, and any implementation schedule, if required, may be found in Part 1 (Effluent Limitations and Monitoring Requirements) of the Draft Permit. The permit re-application is part of the administrative file (Permit No. MA0001830).

A. General Requirements

The Clean Water Act (CWA) prohibits the discharge of pollutants to waters of the United States without a NPDES permit unless such a discharge is otherwise authorized by the CWA. The NPDES permit is the mechanism used to implement technology and water quality-based effluent limitations and other requirements including monitoring and reporting. The draft permit was developed in accordance with various statutory and regulatory requirements established pursuant to the CWA and applicable State regulations. During development, EPA considered the most recent technology-based treatment requirements, water quality-based requirements, and all limitations and requirements in the current/existing permit. The regulations governing the EPA NPDES permit program are generally found at 40 CFR Parts 122, 124, 125, and 136. The general conditions of the draft permit are based on 40 CFR §122.41 and consist primarily of management requirements common to all permits. The effluent monitoring requirements have been established to yield data representative of the discharge under authority of Section 308(a) of the CWA in accordance with 40 CFR §122.41(j), §122.44(i), and §122.48.

1. Technology-Based Requirements

Subpart A of 40 CFR §125 establishes criteria and standards for the imposition of technology-based treatment requirements in permits under Section 301(b) of the CWA, including the application of EPA promulgated effluent limitations and case-by-case determinations of effluent limitations under Section 402(a)(1) of the CWA.

Technology-based treatment requirements represent the minimum level of control that must be imposed under Sections 301(b) and 402 of the CWA (see 40 CFR §125 Subpart A) to meet best practicable control technology currently available (BPT) for conventional pollutants and some metals, best conventional control technology (BCT) for conventional pollutants, and best available technology economically achievable (BAT) for toxic and non-conventional pollutants. In general, technology-based effluent guidelines for non-POTW facilities must be complied with as expeditiously as practicable but in no case later than three years after the date such limitations are established and in no case later than March 31, 1989 [See 40 CFR §125.3(a)(2)]. Compliance schedules and deadlines not in accordance with the statutory provisions of the CWA cannot be authorized by a NPDES permit.

EPA has promulgated technology-based National Effluent Guidelines for Crushed Stone, which contains an effluent limitation guideline of 6.0-9.0 SU for pH. Additionally, EPA has promulgated technology-based National Effluent Guidelines for Construction Sand and Gravel, which contains an effluent limitation guideline of 6.0-9.0 SU for pH.

In the absence of technology-based effluent guidelines, the permit writer is authorized under Section 402(a)(1)(B) of the CWA to establish effluent limitations on a case-by-case basis using Best Professional Judgement (BPJ). The 2000 Multi-Sector General Permit for storm water discharges from industrial sources was reviewed to determine technology-based limitations for

this facility. Sector J of the MSGP (Mineral Mining and Dressing) includes effluent limitations for SIC Code 1429 (25mg/L monthly average for TSS, 45 mg/L daily maximum for TSS, and 6.0-9.0 SU for pH). Sector E of the MSGP (Glass Clay, Cement, Concrete, and Gypsum Products) includes benchmark monitoring cutoff concentrations for SIC Code 3273 of 100 mg/L for TSS and 1.0 mg/L for Total Recoverable Iron.

2. Water Quality-Based Requirements

Water quality-based criteria are required in NPDES permits when EPA and the State determine that effluent limits more stringent than technology-based limits are necessary to maintain or achieve state or federal water-quality standards (See Section 301(b) (1)(C) of the CWA). Water quality-based criteria consist of three (3) parts: 1) beneficial designated uses for a water body or a segment of a water body; 2) numeric and/or narrative water quality criteria sufficient to protect the assigned designated use(s) of the water body; and 3) anti-degradation requirements to ensure that once a use is attained it will not be degraded. The Massachusetts State Water Quality Standards, found at 314 CMR 4.00, include these elements. The State Water Quality Regulations limit or prohibit discharges of pollutants to surface waters and thereby assure that the surface water quality standards of the receiving water are protected, maintained, and/or attained. These standards also include requirements for the regulation and control of toxic constituents and require that EPA criteria, established pursuant to Section 304(a) of the CWA, be used unless site-specific criteria are established. EPA regulations pertaining to permit limits based upon water quality standards and state requirements are contained in 40 CFR §122.44(d).

Section 101(a)(3) of the CWA specifically prohibits the discharge of toxic pollutants in toxic amounts. The Commonwealth of Massachusetts (State) has a similar narrative criterion in their water quality regulations that prohibits such discharges [See Massachusetts Title 314 CMR 4.05(5)(e)]. The effluent limits established in the Draft Permit assure that the surface water quality standards of the receiving water are protected, maintained, and/or attained.

Section 303(d) of the Federal Clean Water Act (CWA) requires states to identify those water bodies that are not expected to meet surface water quality standards after the implementation of technology-based controls and, as such require the development of total maximum daily loads (TMDL). The Final Massachusetts Year 2004 Integrated List of Waters states that Foster Pond, in Swampscott, is not attaining water quality standards due to pathogens. The North Shore Coastal Watersheds 2002 Water Quality Assessment Report indicates that Foster Pond (Segment MA93026) is impaired for fish consumption by an unknown source of DDT. The uses of aquatic life, primary contact, secondary contact, and aesthetics have not been assessed. Additionally, the Final Massachusetts Year 2004 Integrated List of Waters states that Forest River (which receives flow from Outfall 002 via Thompson's Meadow) is not attaining water quality standards due to organic enrichment/low DO and pathogens as well as flow alteration and other habitat alteration.

3. Anti-Backsliding

EPA's anti-backsliding provision as identified in Section 402(o) of the Clean Water Act and at 40 CFR §122.44(l) prohibits the relaxation of permit limits, standards, and conditions unless the circumstances on which the previous permit was based have materially and substantially changed since the time the permit was issued. Anti-backsliding provisions apply to effluent limits based on technology, water quality, BPJ and State Certification requirements. Relief from anti-backsliding provisions can only be granted under one of the defined exceptions [See 40 CFR §122.44(l)(i)]. Since none of these exceptions apply to this facility, the effluent limits in the Draft Permit must be as stringent as those in the Current Permit.

4. Anti-Degradation

The Massachusetts Anti-Degradation Policy is found at Title 314 CMR 4.04. All existing uses of Foster Pond, Thompson's Meadow, and the wetland system must be protected. The State of Massachusetts 2002 Water Quality Assessment Report for the North Shore Coastal Watersheds does not address Thompson's Meadow or the wetland system that receives the discharge from Outfall 002. Under Massachusetts Surface Water Quality Standards 314 CMR 4.06 (4) – Basin Classification and Maps – Other Waters, it states that "Unless otherwise designated in 314 CMR 4.06 or unless otherwise listed in the tables to 314 CMR 4.00, other waters are Class B, and presumed High Quality Waters for inland waters." Therefore, the wetland system is classified as a Class B water body. Foster Pond is also classified as a Class B water body by the State of Massachusetts. Class B waters are designated as habitat for fish, other aquatic life and wildlife and for primary and secondary contact recreation. Where designated they shall be suitable as a source of public water supply with appropriate treatment. They shall be suitable for irrigation and other agricultural uses and for compatible industrial cooling and process uses. These waters shall have consistently good aesthetic value.

B. Description of the Facility

The quarry is located on the northern side of the site. Water from the quarry is pumped to the main settling pond, which covers approximately 4.2 acres, and is then pumped by one of two 650 gpm pumps for use in quarry operations or to the holding pond for discharge through Outfall 001. Quarry operations which require water are dust control, the RMC plant (when operating), various vehicle/equipment washing, and aggregate washing. A well is located in the granules plant area from which water is pumped for use on-site, as listed above, and to supply non-potable water to the toilets and sinks in the office building.

Water for dust control is sprayed by trucks throughout the site on an as needed basis. This water either evaporates, infiltrates, or ultimately drains to the holding pond at Outfall 001 or the catch basin (CB#4) at Outfall 002.

Aggregate produces ready-mix concrete on-site. A concrete washout facility at the RMC plant is

used to collect process water associated with the RMC trucks. The RMC plant was last operated on January 17, 2007. Aggregate plans to resume operations at the RMC plant in the spring. The RMC plant is a closed-loop system and thus does not discharge any process water.

The granules plant is currently not in operation and Aggregate plans to dismantle the plant in the future. When operating in the past, there were no discharges of process water from the granule plant operations. Therefore, discharge of water from the granules plant is prohibited in this permit.

Water used at the wheel wash, located near the Ready-Mix Concrete (RMC) plant area, is supplied by the quarry, and recycled through a closed-loop water system which is purged once per month. When purged, the water from the wheel wash is pumped back to the quarry and replaced by quarry water. Vehicles drive through the wheel wash and water sprays the tires to reduce the amount of dust on the vehicles. No surfactants are used at the wheel wash.

All storm water and wash water from the maintenance garage area is treated by an oil/water separator and discharged to the quarry. Activities that occur in the maintenance garage area are vehicle maneuvering in the paved area, truck and quarry equipment repair and maintenance within the garage, deliveries of materials used in the vehicle/equipment repair, steam cleaning of vehicles, and equipment washing. No surfactants are used in any washing/steam cleaning done onsite. All floor drains located within the maintenance garage have been blocked. Sources of potential pollutants used in the maintenance garage are engine and transmission oils, lubricant for servicing vehicles/equipment, solvents used for cleaning, vehicle brake dust, and fuel oil.

Water for aggregate washing is supplied to the wash plant and the resultant process wastewater flows via a sluiceway into the wash plant settling pond, which covers approximately 0.1 acres, where flocculants (in pellet form) are added to aid in settling out the fines. The wash plant settling pond is typically dredged weekly during the operating season (April 1 – December 15th) and the materials are stockpiled onsite for sale. A portion of the treated wastewater from the wash plant settling pond is pumped back to the main settling pond by a 100 gpm pump. The remaining portion of treated wastewater flows through a trench by gravity to the main settling pond.

Several above ground storage tanks (ASTs) are located at the facility, providing storage for diesel fuel, gasoline, No. 2 fuel oil, and several types of oil (heating, hydraulic, mineral, and crusher). Gasoline and diesel fuel, used for vehicle fueling, are stored near the entrance road to the facility. The crusher for the quarry operations utilizes crusher oil. The granules plant historically used mineral oil in the process, and No. 2 fuel oil to power the plant. Smaller storage tanks of No. 2 fuel oil are used to heat the various buildings on site. Hydraulic oil, motor oil, and waste oil tanks are located in or just outside of the maintenance garage. The containment areas of the ASTs are never drained. Discharge from the containment of the ASTs is therefore prohibited in the permit.

A minimal amount of storm water flows onto the road from near the main office building. The water flows mainly from a parking area and vehicle access road in an easterly direction across Danvers Road and infiltrates the ground in the area of the adjacent railroad tracks. Aggregate plans to alter the current configuration to avoid this storm water flow offsite.

C. Description of Discharge

1. Outfall 001

Aggregate Industries draws water, approximately 546,000 gpd, (based on a pump rate of 650 gpm over 14 hours) from the main settling pond for use in washing operations. Water is pumped from the pond through a 6" water line to the top of the wet screen tower where it is used to wash aggregate material. The wastewater, approximately 525,000 gpd, is conveyed from the wet screen tower via a sluiceway and discharged into the wash plant settling pond, where the majority of the solids settle out. From there, a portion of the wastewater flows by gravity and the remainder is pumped to the main settling pond where further settling occurs. Water that is not re-used as process water is pumped into a holding pond. The holding pond is located on the southwest corner of the property and covers approximately 0.9 acres. The holding pond discharges water through Outfall 001, via gravity, through a stone filter located at the east end of Foster Pond. Aggregate plans to modify the manner of discharge to create a more discernible point source into Foster's Pond. The discharge consists of treated process water, ground water seepage from quarry dewatering, and storm water which drains 79.5 acres (10 acres of which is impervious). Additionally, storm water and wash water from the maintenance garage area is discharged through Outfall 001 after treatment by an oil/water separator, via the quarry. Process water discharged from the site consists of sand and gravel wash water, quarry dewatering, dust control water, steam cleaning water, equipment wash water, and wheel wash water.

2. Outfall 002

The discharge from Outfall 002 consists of dust control runoff and storm water runoff, which occurs during and after rain events, from a drainage area of 21.5 acres (11 acres of which is impervious). The storm water consists of runoff from the RMC plant area, the granules plant area, and a fueling area. The storm water discharge is currently covered under the Stormwater Multi-Sector General Permit (MSGP). Aggregate Industries is seeking coverage for both process wastewater and storm water discharges under this single individual permit. Once this permit is finalized, Aggregate Industries will file a Notice of Termination with regard to MSGP coverage. A sample representative of the storm water discharge through Outfall 002 shall be taken at Catch Basin #4 (located near the granules plant area), at a location where all storm water runoff which flows through Outfall 002 collects prior to discharge.

D. Discharge Location

1. Outfall 001

Outfall 001 discharges through a stone filter to Foster Pond. It was previously thought that Foster Pond discharges through a wetlands system which includes Thompson's Meadow and is adjacent to Forest River. Forest River flows to Salem Harbor, which empties into the Atlantic Ocean.

However, the Swampscott Conservation Commission has indicated that hydrology may flow in a westerly direction, to a tributary to the Valley Road/Manson Street headwall and into the City of Lynn Municipal Storm Sewer System to the Atlantic Ocean. EPA has confirmed through Lynn Water and Sewer that the hydrology does flow in a westerly direction. An engineer at Lynn Water and Sewer, Andy Hall, confirmed that Foster Pond gravity drains to the Lynn Storm Sewer System via Jackson Brook, located on Valley Road.

Therefore, Outfall 001 discharges to Foster Pond, which gravity flows to Jackson Brook and leads to the Valley Road/Manson Street headwall. From the headwall, the water flows via a 72" concrete pipe to the Lynn Storm Sewer System, which drains to Kings Beach into the Atlantic Ocean. See Attachment B for a map of the locations of both Outfalls 001 and 002, and Attachment C for a map of Outfall 001 discharge path from Foster Pond to the Valley Road/Manson Street headwall via Jackson Brook.

The locations of the previous sampling points for Outfall 001 have varied from sampling after the stone berm in Foster Pond, to sampling in the holding pond. The draft permit requires Aggregate to develop and implement an appropriate outfall design to collect representative samples of the discharge from the holding pond to Foster Pond. Aggregate plans to remove the pervious stone berm and install a weir with a discrete discharge point into Foster Pond, in order to provide a representative sampling point of the discharge through Outfall 001.

2. Outfall 002

The discharge through Outfall 002 collects at Catch Basin #4 (CB#4). The flow from CB#4 travels through a series of catch basins and culverts and empties into a wetlands system which includes Thompson's Meadow and is adjacent to Forest River. Forest River flows to Salem Harbor, which empties into the Atlantic Ocean. See Attachment D for a map of the wetlands system.

Sampling for Outfall 002 occurs at CB#4. Sampling at the catch basin across Danvers Road or in front of the maintenance building is not possible due to property ownership, traffic, and safety reasons. However, Aggregate plans to reconstruct CB#4 to decrease the difficulty of sampling for Outfall 002.

E. Proposed Permit Effluent Limitations and Conditions

The sections are divided according to the effluent characteristic being regulated.

1. Outfall 001

a. Flow

The current permit required that the permittee report the maximum and minimum daily rates and the total flow for each operating date. Additionally, the permit required that the permittee report the average monthly flow. The requirement to report the average monthly flow value has been retained in the draft permit. The requirement to report the maximum and minimum daily rates and the total flow for each operating date has been simplified by replacement with a requirement to report the maximum daily flow value. Consistent with the current permit, flow shall be monitored continuously. Previous flow monitoring at the site reported a monthly average ranging from 0.38 – 3.1 mgd, with an average value of 0.860 mgd.

b. pH

The pH limitation range of 6.5-8.3 SU has been retained in the draft permit in accordance with anti-backsliding requirements found in 40 CFR §122.44(l). The pH limits are based on the Massachusetts Surface Water Quality Standards, 314 Code of Massachusetts Regulations ("CMR"), Inland Water, Class B at 4.05 (3)(b)3. These standards require that the pH of the receiving water be in the range of 6.5 to 8.3 standard units and no more than 0.5 units outside the background range. There shall no change from background conditions that would impair any use assigned to this Class. The water quality criteria have been adopted as discharge limitations based on certification requirements under Section 401(a)(1) of the CWA, as described in 40 CFR 124.53 and 124.55.

Review of the DMR data reveals that the pH limit range was exceeded on six occasions. The highest exceedence was 8.6 SU and the lowest was 6.1 SU. Based on these monitoring results, the sampling frequency for pH shall remain unchanged as 1/week.

c. Settleable Solids

The current permit required weekly monitoring of both the average monthly and the maximum daily settleable solids. Review of the DMR data reveals that on the average, the average monthly settleable solids concentration was 0.005 mL/L and the daily max settleable solids concentrations was 0.008 mL/L. Settleable solids were only detected on eight occasions.

However, the requirement to monitor for settleable solids has been removed from the draft permit based on the fact that settleable solids are a subset of total suspended solids (TSS). Therefore, the effluent requirements for TSS will essentially limit the amount of settleable solids in the discharge.

d. Total Suspended Solids (TSS)

TSS is a typical storm water pollutant and an indicator of chemical constituents in the discharge. Due to nature of the operations at the facility, oil and rock particles are expected to be in the discharge. Heavy metals and polynuclear aromatic hydrocarbons are readily adsorbed onto particulate matter and the release of these compounds can be controlled, to an extent, by regulating the amount of TSS released into the environment. The current permit limits for TSS of 25 mg/L average monthly and 45 mg/L maximum daily have been retained in the draft permit in accordance with anti-backsliding requirements found in 40 CFR §122.44(l). Review of DMR data reveals that the maximum daily TSS limit was exceeded on two occasions, with a maximum exceedence of 65 mg/L. However, the discharge has not exceeded the permit limits for TSS since 2002. Based on these monitoring results, the sampling frequency for TSS has been reduced to 1/month.

e. Turbidity

In accordance with anti-backsliding requirements found in 40 CFR §122.44(l), the average monthly limit of 8 NTU and the maximum daily limit of 25 NTU have been retained in the draft permit. Review of DMR data reveals that the maximum daily effluent limitation has been exceeded on 5 occasions, and the average monthly limit has been exceeded on 16 occasions. Based on these monitoring results, the sampling frequency for turbidity shall remain unchanged at 1/week. Additionally, the draft permit shall require the permittee to develop and implement BMPs, pursuant to the SWPPP, and to consider treatment options in the future, in order to reduce the amount of turbidity in the discharge from the facility.

f. Ammonia, Total

The current permit required weekly monitoring of the average monthly concentration for total ammonia. EPA's *Current National Recommended Water Quality Criteria*, freshwater criteria for ammonia are pH, temperature, and life-stage dependent. According to the procedures described in the *Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses*, except possibly where a very sensitive species is important at a site, freshwater aquatic life should be protected if both conditions specified in Appendix C to the Preamble - Calculation of Freshwater Ammonia Criterion (see Attachment F – Temperature and pH-Dependent Values of the CCC for Fish Early Life Stages Present) are satisfied. Assuming salmonid fish are present, since the surrounding waters are classified as EFH for such fish, and using the maximum pH value of 8.6 SU, the one-hour average concentration of total ammonia nitrogen shall not exceed, more than once every three years on the average, a CMC (acute criterion) of 1.77 mg N/L (See Attachment F). Using temperature data from Aggregates January 20, 2005 permit re-application of 41°F (5°C) during the winter and 72°F (22°C) during the summer, and assuming fish early life stages are present, the thirty-day concentration of total ammonia nitrogen shall not exceed, more than once every three years on the average, a CCC (chronic criterion) range of 0.920 mg N/L during the winter and of 0.568 during the summer (See Attachment F).

Review of DMR data reveals that the highest average monthly concentration of total ammonia was 15.4 ug/L (0.0154 mg/L) and the average of the values reported was 0.448 ug/L. Converted to ammonia, the calculated freshwater ammonia nitrogen CCC's of 0.568 and 0.920 mg N/L are approximately 0.732 and 1.18 mg/L total ammonia, respectively.[1] Comparison of these CCC values to the highest average monthly concentration of total ammonia (0.0154 mg/L) shows that there is no reasonable potential to exceed the CCC values, and thus no need to implement an effluent limitation at this time. Average monthly ammonia shall be continued to be monitored in the draft permit, however, the monitoring frequency of 1/week in the current permit has been reduced to 1/month.

g. Oil and Grease (O&G)

The maximum daily limit for oil and grease is based on The Massachusetts Surface Water Quality Standards. These standards under 314 Code of Massachusetts Regulations ("CMR") 4.05(3)(b)(7), state:

> These waters shall be free from oil, grease and petrochemicals that produce a visible film in the surface of the water, to impart an oily taste to the water or an oily or other undesirable taste to the edible portions of aquatic life, coat the banks or bottom of the water course, or are deleterious or became toxic to aquatic life.

An effluent concentration of 15 mg/l is recognized as the concentration at which many oils produce a visible sheen and/or cause an undesirable taste in edible fish. One previous monitoring result submitted on the permit re-application detected oil and grease at a concentration of 0.29 mg/L. The draft permit shall require an O&G maximum daily effluent limitation of 15 mg/L, monitored monthly, to ensure compliance with State water quality standards.

h. Benzene, Toluene, Ethylbenzene, and Total Xylenes (BTEX)

Monitoring for BTEX compounds is required in the draft permit based on fueling that occurs outside at the maintenance garage area. Refined petroleum products contain numerous types of hydrocarbons. Individual components partition to environmental media on the basis of their physical/chemical properties (e.g., solubility, vapor pressure). Rather than attempt to establish effluent limits for every compound found in a petroleum release, limits are typically established for the compounds that would be most difficult to remove as well as demonstrate the greatest degree of toxicity. Generally, the higher the solubility of a volatile organic compound (VOC) in water, the more difficult it is to remove.

VOCs such as benzene, toluene, ethylbenzene, and the three xylene compounds (BTEX) are normally found at relatively high concentrations in gasoline and light distillate products (e.g., diesel fuel). The traditional approach for limiting effluents contaminated with gasoline or other

1 The conversion factor of 1.2883 is based upon weight proportions of the nitrogen and hydrogen in ammonia (1.3 grams ammonia contain 1 gram nitrogen).

light distillates is to place limits on the individual BTEX compounds and/or the sum of total BTEX compounds. This approach stems from the petroleum-industry practice of determining the quality of fuels by measuring BTEX, which are highly variable among gasoline products. Another reason for limiting BTEX is that EPA and the State have promulgated water quality criteria for BTEX.

To better regulate the "potential" for gasoline and/or light distillates to come in contact with storm water via product spills during fueling operations, EPA included a monthly monitoring requirement for each BTEX compound (benzene, toluene, ethylbenzene, and total xylenes) in the draft permit as well as for total BTEX.

i. Nitrates

EPA's *Current National Recommended Water Quality Criteria* for nitrates is 10,000 ug/L for human health consumption of water and the organism. One previous monitoring result from the permit re-application for nitrate of 6.38 mg/L (6,380 ug/L) was below this human health criteria. However, due to the use of ammonium nitrite as an explosive onsite, there is potential for presence of nitrates in the storm water at the facility. Therefore, the draft permit shall require the monitoring for nitrates, on a monthly basis.

j. Whole Effluent Toxicity (WET) Test

Under Section 301(b)(1)(C) of the CWA, discharges are subject to effluent limitations based on water quality standards. The Massachusetts Surface Water Quality Standards include the following narrative statement and requires that EPA criteria established pursuant to Section 304(a)(1) of the CWA be used as guidance for interpretation of the following narrative criteria: All surface waters shall be free from pollutants in concentrations or combinations that are toxic to humans, aquatic life or wildlife.

The Region typically includes toxicity testing requirements where a combination of toxic constituents may be toxic to humans, aquatic life, or wildlife. Section 101(a)(3) of the CWA specifically prohibits the discharge of toxic pollutants in toxic amounts.

Due to the wide range of explosives used at the facility and the potential integrated effects of these pollutants, as well as the potential for toxicity resulting from the combination of pollutants in the facility's storm water, in accordance with EPA national and regional policy, and in accordance with MassDEP policy, the draft permit includes acute and chronic toxicity monitoring requirements. (See Policy for the Development of Water Quality-Based Permit Limitations for Toxic Pollutants,50 Fed. Reg. 30,784 (July 24, 1985); EPA's Technical Support Document for Water Quality-Based Toxics Control" on September, 1991; and MassDEP's Implementation Policy for the Control of Toxic Pollutants in Surface Waters (February 23, 1990).

The draft permit requires that the permittee conduct one freshwater chronic (and modified acute)

WET testing for the Outfall 001 effluent, during each year of the effectiveness of the permit. The chronic test may be used to calculate the acute LC_{50} at the 48 hour exposure interval. The permittee shall test the daphnid, Ceriodaphnia dubia, and fathead minnow, Pimephales promelas. The tests must be performed in accordance with test procedures and protocols specified in Attachment 1 of the permit.

k. Total Recoverable Iron

Sector E of the MSGP (Glass Clay, Cement, Concrete, and Gypsum Products) for SIC Code 3273 contains a benchmark monitoring cutoff concentration of 1.0 mg/L for total recoverable iron. One previous monitoring result from Aggregates January 20, 2005 permit re-application for total recoverable iron of 0.47 mg/L was below this benchmark monitoring concentration. However, if future monitoring (such as the priority pollutant scan required in the permit re-application) shows that this benchmark monitoring cutoff concentration is exceeded, the facility may be required to sample for iron, and/or develop BMPs, pursuant to the SWPPP, to reduce the level of iron in the discharge from the facility. The draft permit does not require monitoring for iron at this time.

2. Outfall 002

The discharge through Outfall 002 was previously covered under the MSGP, and thus no monitoring requirements existed for Outfall 002 under the current individual permit.

a. Flow

The draft permit requires monitoring of both the average monthly flow value and the maximum daily flow value on a monthly basis. Calculations provided by Aggregate Industries indicate that the maximum flow from Outfall 002 should be no greater than 1.51 mgd.

b. pH

The draft permit requires an effluent limitation range for pH of 6.5-8.3 SU, based on the Massachusetts Surface Water Quality Standards, 314 Code of Massachusetts Regulations ("CMR"), Inland Water, Class B at 4.05 (3)(b)3. These standards require that the pH of the receiving water be in the range of 6.5 to 8.3 standard units and no more than 0.5 units outside the background range. There shall no change from background conditions that would impair any use assigned to this Class. The water quality criteria have been adopted as discharge limitations based on certification requirements under Section 401(a)(1) of the CWA, as described in 40 CFR 124.53 and 124.55. The pH of the discharge shall be monitored on a monthly basis.

c. Total Suspended Solids (TSS)

TSS is a typical storm water pollutant and an indicator of chemical constituents in the discharge. Due to nature of the operations at the facility, oil and rock particles are expected to be in the

discharge. Heavy metals and polynuclear aromatic hydrocarbons are readily adsorbed onto particulate matter and the release of these compounds can be controlled, to an extent, by regulating the amount of suspended solids released into the environment. The same effluent limitations for Outfall 001 shall be applied at Outfall 002. Therefore, the draft permit requires effluent limitations for TSS of 25 mg/L average monthly and 45 mg/L maximum daily, monitored 1/month.

d. Turbidity

Due to the nature of the operation at the facility, fine soil particles and dust are expected in the storm water discharge. Turbidity of water is related to the amount of suspended and colloidal material present in the water column. Aside from the aesthetic problems of color that a turbid discharge can create, turbidity reduces water clarity; therefore, the penetration of light into that water column is reduced, negatively impacting the growth and life cycles of various aquatic species (plants and animals). Therefore, the draft permit requires the permittee to monitor turbidity, on a monthly basis.

e. Oil and Grease

The maximum daily limit for oil and grease is based on The Massachusetts Surface Water Quality Standards. These standards under 314 Code of Massachusetts Regulations ("CMR") 4.05(3)(b)(7), state:

> These waters shall be free from oil, grease and petrochemicals that produce a visible film in the surface of the water, to impart an oily taste to the water or an oily or other undesirable taste to the edible portions of aquatic life, coat the banks or bottom of the water course, or are deleterious or became toxic to aquatic life.

An effluent concentration of 15 mg/l is recognized as the concentration at which many oils produce a visible sheen and/or cause an undesirable taste in edible fish. The draft permit shall require an O&G maximum daily effluent limitation of 15 mg/L, monitored monthly, to ensure compliance with State water quality standards.

f. Benzene, Toluene, Ethylbenzene, and Total Xylenes (BTEX)

Monitoring for BTEX compounds is required in the draft permit based on fueling and fuel storage that occurs onsite. Diesel fuel, gasoline, and No. 2 Fuel Oil are stored onsite in above ground storage tanks. Refined petroleum products contain numerous types of hydrocarbons. Individual components partition to environmental media on the basis of their physical/chemical properties (e.g., solubility, vapor pressure). Rather than attempt to establish effluent limits for every compound found in a petroleum release, limits are typically established for the compounds that would be most difficult to remove as well as demonstrate the greatest degree of toxicity. Generally, the higher the solubility of a volatile organic compound (VOC) in water, the more

difficult it is to remove.

VOCs such as benzene, toluene, ethylbenzene, and the three xylene compounds (BTEX) are normally found at relatively high concentrations in gasoline and light distillate products (e.g., diesel fuel). The traditional approach for limiting effluents contaminated with gasoline or other light distillates is to place limits on the individual BTEX compounds and/or the sum of total BTEX compounds. This approach stems from the petroleum-industry practice of determining the quality of fuels by measuring BTEX, which are highly variable among gasoline products. Another reason for limiting BTEX is that EPA and the State have promulgated water quality criteria for BTEX.

To better regulate the "potential" for gasoline and/or light distillates to come in contact with storm water via product spills during fueling operations, EPA included a monitoring requirement for each BTEX compound (benzene, toluene, ethylbenzene, and total xylenes) in the draft permit as well as a monitoring requirement for total BTEX. The monitoring frequency shall be once per month.

g. Total Recoverable Iron

Sector E of the MSGP (Glass Clay, Cement, Concrete, and Gypsum Products) for SIC Code 3273 contains a benchmark monitoring cutoff concentration of 1.0 mg/L for total recoverable iron. One previous monitoring result from the permit re-application for total recoverable iron of 0.47 mg/L was below this benchmark monitoring concentration. However, if future monitoring (such as the priority pollutant scan required in the permit re-application) shows that this benchmark monitoring cutoff concentration is exceeded, the facility may be required to sample for iron, and/or develop BMPs, pursuant to the SWPPP, to reduce the level of iron in the discharge from the facility. The draft permit does not require monitoring for iron at this time.

3. Storm Water Pollution Prevention Plan

This facility engages in activities which could result in the discharge of pollutants to waters of the United States either directly or indirectly through storm water runoff. These operations include at least one of the following in an area potentially exposed to precipitation or storm water: material storage, in-facility transfer, material processing, material handling, or loading and unloading. To control the activities/operations, which could contribute pollutants to waters of the United States, potentially violating the State's Water Quality Standards, the Draft Permit requires the facility to develop, implement, and maintain a Storm Water Pollution Prevention Plan (SWPPP) containing best management practices (BMPs) appropriate for this specific facility (See Sections 304(e) and 402(a)(1) of the CWA and 40 CFR §125.103(b)). Specifically, at this facility, aggregate storage is an example of material storage operations, stone processing is an example of processing operations, and transporting of crushed stone throughout the site as well as fueling is an example of handling operations that shall continue to be included in the SWPPP.

The goal of the SWPPP is to reduce, or prevent, the discharge of pollutants through the storm water system. The SWPPP requirements in the Draft Permit are intended to provide a systematic approach by which the permittee shall at all times, properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of the permit. The SWPPP shall be prepared in accordance with good engineering practices and identify potential sources of pollutants, which may reasonably be expected to affect the quality of storm water discharges associated with industrial activity from the facility. The SWPPP, upon implementation, becomes a supporting element to any numerical effluent limitations in the Draft Permit. Consequently, the SWPPP is as equally enforceable as the numerical limits.

This process involves the following five main steps:

1) Forming a team of qualified facility personnel who will be responsible for developing and updating the SWPPP and assisting the plant manager in its implementation;
2) Assessing the potential storm water pollution sources;
3) Selecting and implementing appropriate management practices and controls for these potential pollution sources; and
4) Reevaluating, periodically, the effectiveness of the SWPPP in preventing storm water contamination and in complying with the various terms and conditions of the Draft Permit.
5) Development and implementation of site specific BMPs:
    a. To ensure proper inspection and cleaning of the oil/water separator. The oil/water separator shall be inspected at least quarterly and cleaned at least annually.
    b. To require storage of materials and equipment such that contact with storm water is limited, and avoided whenever possible.
    c. To ensure all site storm water not discharged through Outfalls 001 or 002 remains onsite.
    d. To require proper cleanup of any residuals from previous manufacturing processes.
    e. To reduce the amount of turbidity in the effluent.

4. Additional Requirements and Conditions

These effluent monitoring requirements have been established to yield data representative of the discharge under the authority of Section 308(a) of the CWA in accordance with 40 CFR §122.41(j), §122.44(i) and §122.48.

The remaining conditions of the draft permit are based on the NPDES regulations, Part 122 through 125 and consist primarily of management requirements common to all permits.

V. ENDANGERED SPECIES ACT

Section 7(a) of the Endangered Species Act of 1973, as amended (ESA) grants authority to and imposes requirements upon Federal agencies regarding endangered or threatened species of fish,

wildlife, or plants ("listed species") and habitat of such species that has been designated as critical (a "critical habitat"). The ESA requires every Federal agency, in consultation with and with the assistance of the Secretary of Interior, to insure that any action it authorizes, funds, or carries out, in the United States or upon the high seas, is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat. The United States Fish and Wildlife Service (USFWS) typically administer Section 7 consultations for bird, terrestrial, and freshwater aquatic species.

EPA has reviewed the federal endangered or threatened species of fish, wildlife, or plants to see if any such listed species might potentially be impacted by the issuance of this NPDES permit. The review has focused on freshwater aquatic species since the discharge is into Foster Pond and a wetlands system which includes Thompson's Meadow and is adjacent to Forest River. In Essex County, the shortnose sturgeon is listed as endangered; however, NMFS has verified that no shortnose sturgeon is present in Foster Pond or the wetlands system which includes Thompson's Meadow. EPA believes that effluent limitations and other permit conditions which are in place in the draft permit should preclude any adverse effects should there be any incidental contact with listed species either in Foster Pond or Thompson's Meadow. During the public comment period, EPA has provided a copy of the draft permit and fact sheet to USFWS.

VI. ESSENTIAL FISH HABITAT

Under the 1996 Amendments (PL 104-267) to the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. § 1801 et seq. (1998)), EPA is required to consult with NMFS if EPA's action or proposed actions that it funds, permits, or undertakes, "may adversely impact any essential fish habitat" (EFH). The Amendments define EFH as "waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity," (16 U.S.C. § 1802(10)). "Adverse impact" means any impact which reduces the quality and/or quantity of EFH (50 C.F.R. 600.910 (a)). Adverse effects may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey, reduction in species' fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions. Id.

Essential fish habitat is only designated for species for which federal fisheries management plans exist (16 U.S.C. § 1855(b)(1)(A)). EFH designations for New England were approved by the U.S. Department of Commerce on March 3, 1999.

A review of the relevant essential fish habitat information provided by NMFS indicates that Foster Pond and Thompson's Meadow are not designated EFH for any federally managed species.

However, essential fish habitat has been designated for 25 managed species in Salem Harbor. The area supports 16 of the 25 listed species during three or more of the life stage categories (i.e. eggs, larvae, juveniles, adults, and spawning adults). A copy of the managed species within the EFH is included in Attachment H to this Fact Sheet. EPA has concluded that adverse effects to

EFH from this permitted discharge have been minimized. This conclusion is based on the amount and frequency of the discharge, as well as effluent limitations and other permit requirements that are identified in this Fact Sheet. These factors are designated to be protective of all aquatic species, including those with EFH designations.

EPA has determined that no EFH consultation with NMFS is required at this time. If adverse effects are detected as a result of this permit action, NMFS will be notified and an EFH consultation will promptly be initiated. During the public comment period, EPA has provided a copy of the Draft Permit and Fact Sheet to NMFS.

VII. STATE CERTIFICATION REQUIREMENTS

EPA may not issue a permit unless the MassDEP certifies that the effluent limitations contained in the permit are stringent enough to assure that the discharge will not cause the receiving water to violate State Surface Water Quality Standards or unless state certification is waived. The staff of the MassDEP has reviewed the draft permit and advised EPA that the limitations are adequate to protect water quality. EPA has requested permit certification by the State pursuant to 40 CFR §124.53 and expects that the draft permit will be certified.

VIII. ADMINISTRATIVE RECORD, PUBLIC COMMENT PERIOD, HEARING REQUESTS, AND PROCEDURES FOR FINAL DECISION

All persons, including applicants, who believe any condition of the draft permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period, to the U.S. EPA, Office of Ecosystem Protection Attn: Nicole Kowalski, 1 Congress Street, Suite 1100 (CIP), Boston, Massachusetts 02114-2023 or via email to kowalski.nicole@epa.gov. The comments should reference the name and permit number of the facility for which they are being provided.

Any person, prior to such date, may submit a request in writing to EPA and the States Agency for a public hearing to consider the draft permit. Such requests shall state the nature of the issues proposed to be raised in the hearing. A public hearing may be held after at least thirty days public notice whenever the Regional Administrator finds that response to this notice indicates significant public interest. In reaching a final decision on the draft permit, the Regional Administrator will respond to all significant comments and make these responses available to the public at EPA's Boston Office.

Following the close of the comment period, and after a public hearing, if such hearing is held, the Regional Administrator will issue a final permit decision and forward a copy of the final decision to the applicant and each person who has submitted written comments or requested notice. Within thirty (30) days following the notice of final permit decision, permits may be appealed to the Environmental Appeals Board in the manner described at 40 CFR § 124.19.

IX. EPA & MassDEP CONTACTS

Additional information concerning the draft permit may be obtained between the hours of 9:00 a.m. and 5:00 p.m., Monday through Friday, excluding holidays, from the EPA and MassDEP contacts below:

Nicole Kowalski, EPA New England – Region 1
1 Congress Street, Suit 1100 (CIP)
Boston, Massachusetts 02114-2023
Telephone: (617) 918-1746 FAX: (617) 918-0746
email: kowalski.nicole@epa.gov

Paul Hogan, Massachusetts Department of Environmental Protection
Division of Watershed Management, Surface Water Discharge Permit Program
627 Main Street, 2nd Floor
Worcester, Massachusetts 01608
Telephone: (508) 767-2796 FAX: (508) 791-4131
email: paul.hogan@state.ma.us

_____
Date

Stephen S. Perkins, Director
Office of Ecosystem Protection
U.S. Environmental Protection Agency

X. ATTACHMENTS

A. Site Plan

B. Map of Outfall Locations

C. Map of Outfall 001 Discharge Path from Foster Pond to Valley Road/Manson Street Headwall via Jackson Brook

D. Wetlands Map

E. DMR Summary

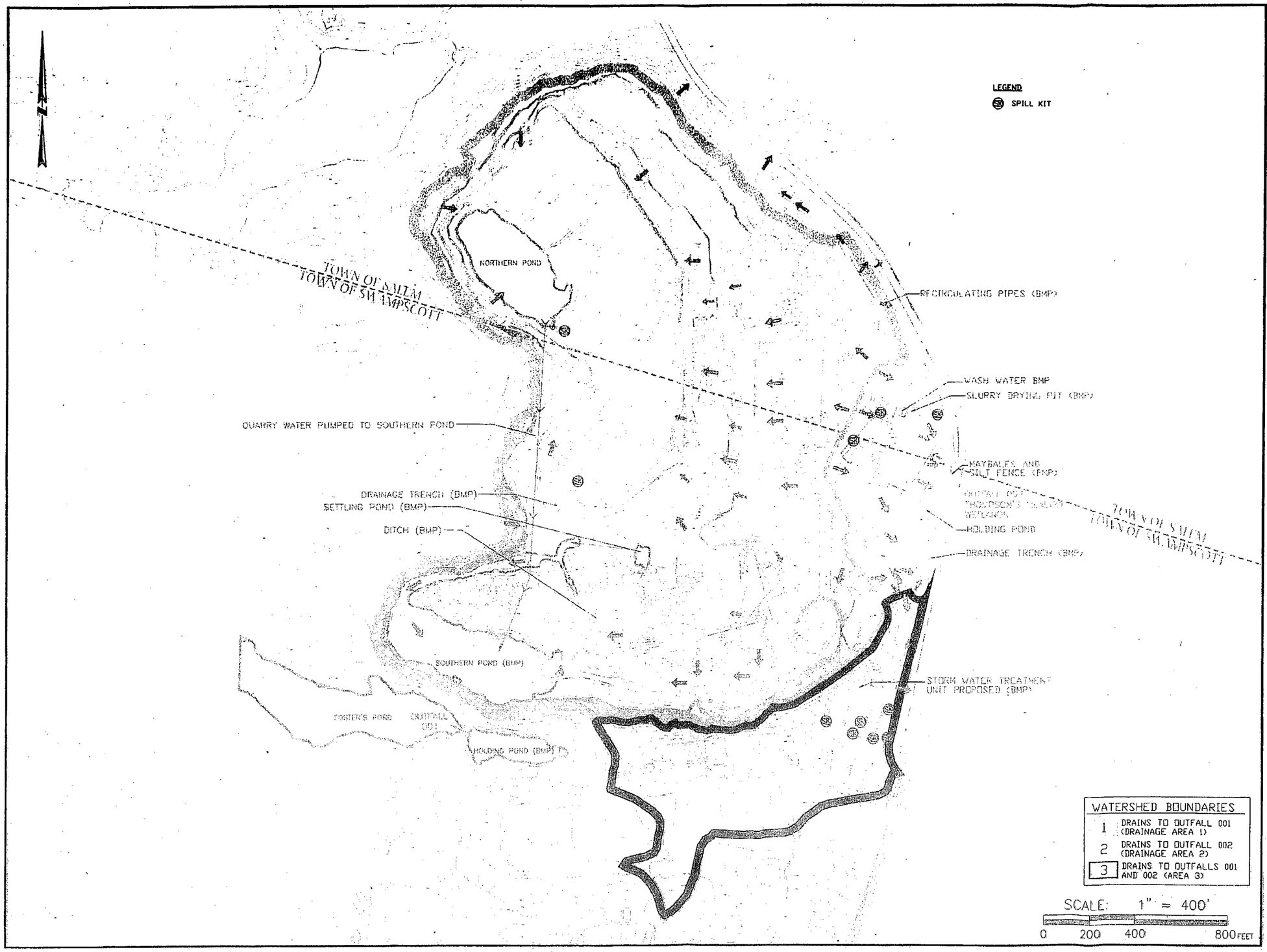
F. pH Dependent Values of the CMC (Acute Criterion)

G. Temperature and pH-Dependent Values of the CCC (Chronic Criterion) for Fish Early Life Stages Present

H. EFH Designation

Attachments to Fact Sheet

Aggregate Industries – MA0001830



AGGREGATE INDUSTRIES

ISSUED FOR PERMITTING
NOT FOR CONSTRUCTION

USER RESPONSIBLE FOR VERIFYING THAT CONTENT OF THIS PLAN HAS NOT BEEN FURTHER REVISED

Attachment A

AGGREGATE INDUSTRIES-NORTHEASTERN REGION, INC.

SWAMPSCOTT QUARRY - SPCC PLAN

30 DANVERS ROAD
SWAMPSCOTT, MASSACHUSETTS

Attachment A – Site Plan

FEBRUARY 2007

REVISIONS:

NO.	DATE	DESC.

REFERENCE: ESS GROUP, INC.
FIGURE 4, OCTOBER 2005

PREPARED FOR:
AGGREGATE INDUSTRIES
1715 BROADWAY
SAUGUS, MA

BSC GROUP
33 Waldo Street
Worcester, Massachusetts
01608
508 792 4500

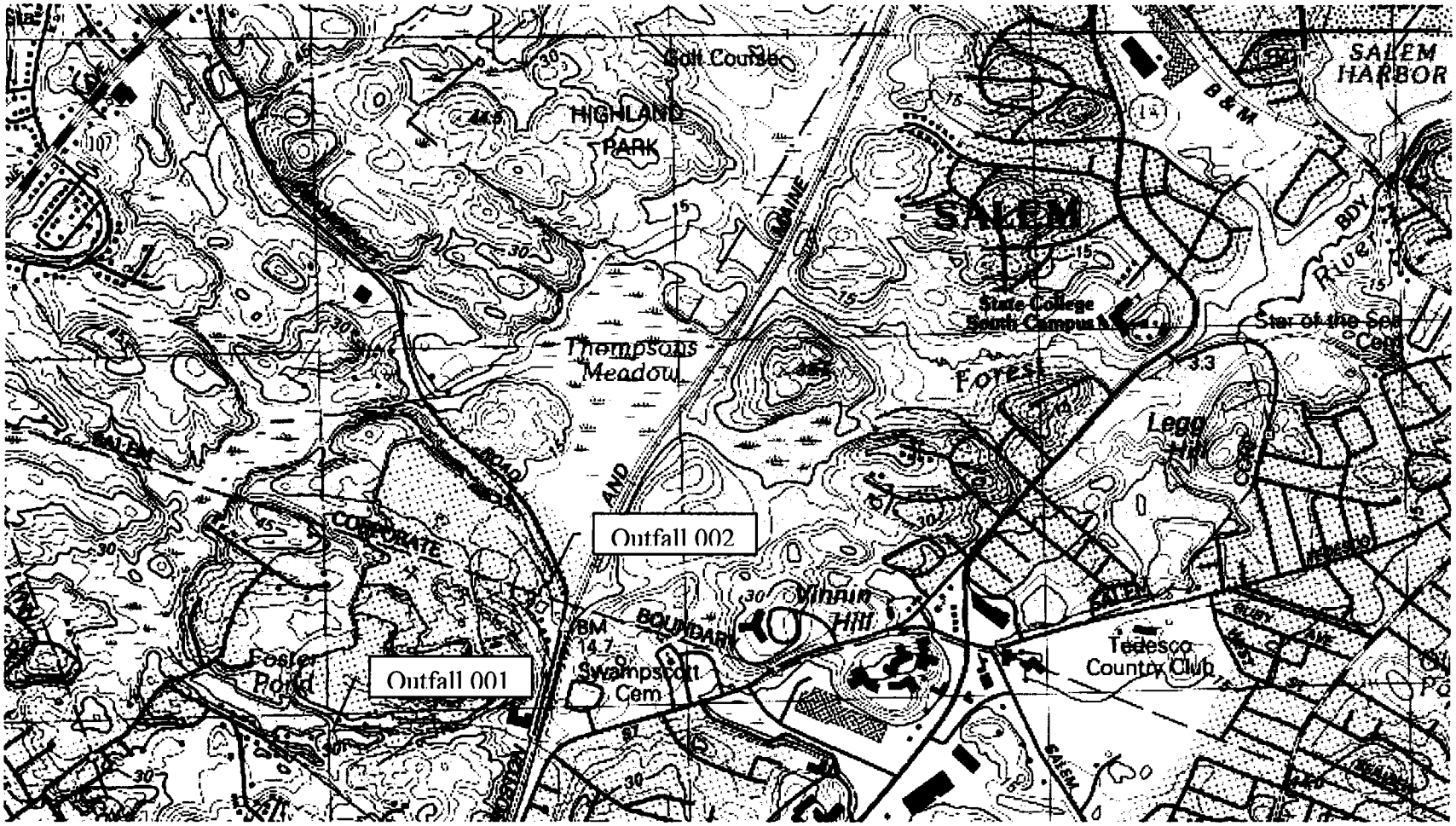
FILE:SWAMPSCOTT\SPCC\SITE_11X17.DWG

DWG. NO:

JOB. NO: 89329.03

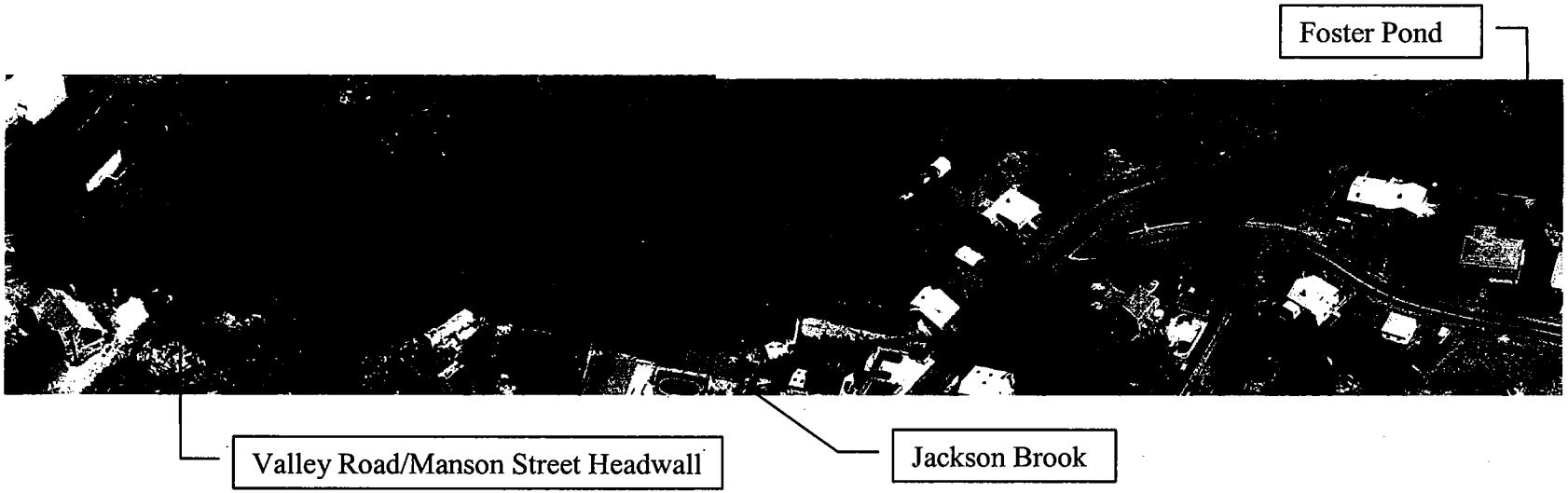
SHEET 1 OF 1

Attachment B – Map of Outfall Locations



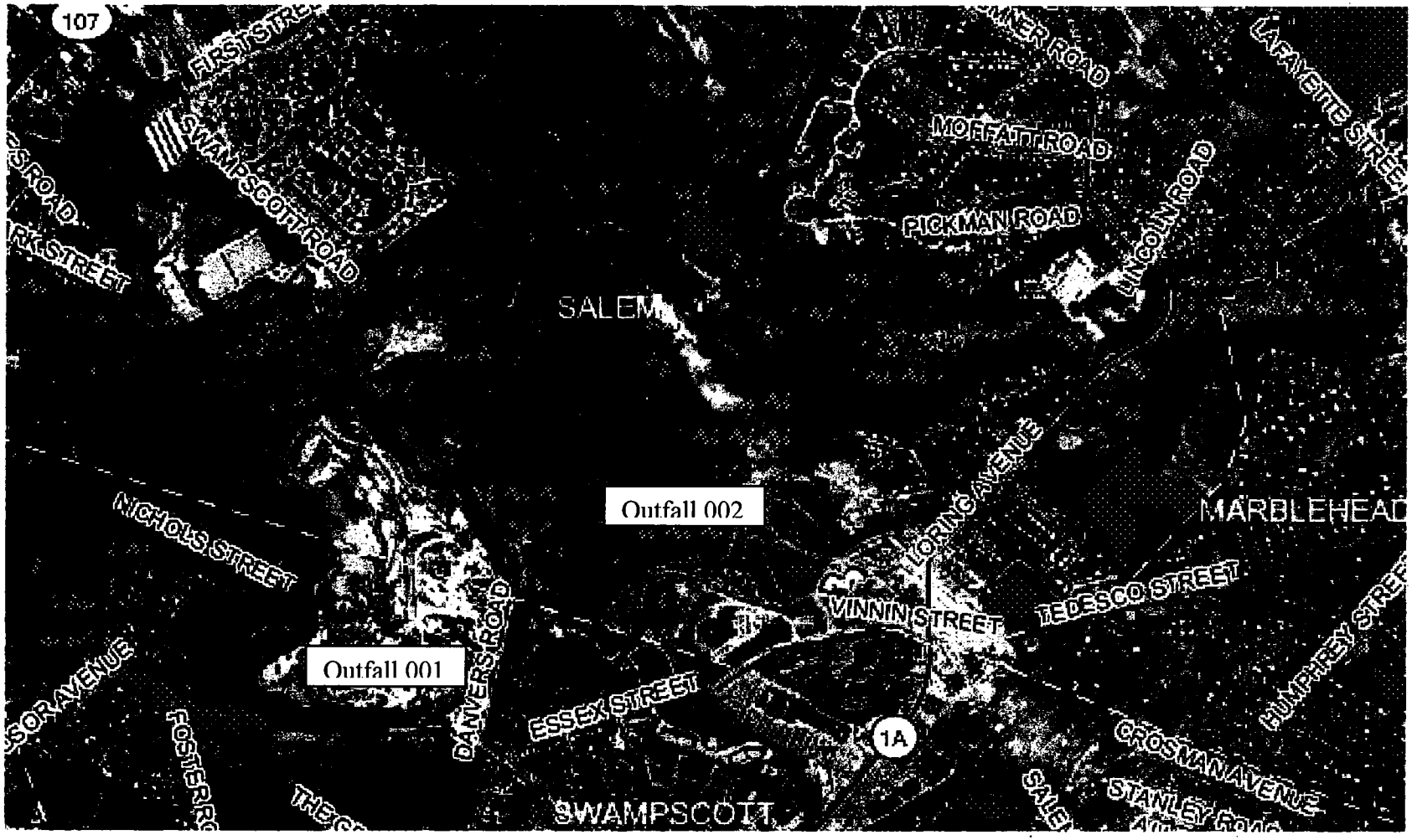
Source: http://maps.massgis.state.ma.us/MassGISTopos/viewer.htm

Attachment C – Map of Outfall 001 Discharge Path from Foster Pond to Valley Road/Manson Street Headwall via Jackson Brook



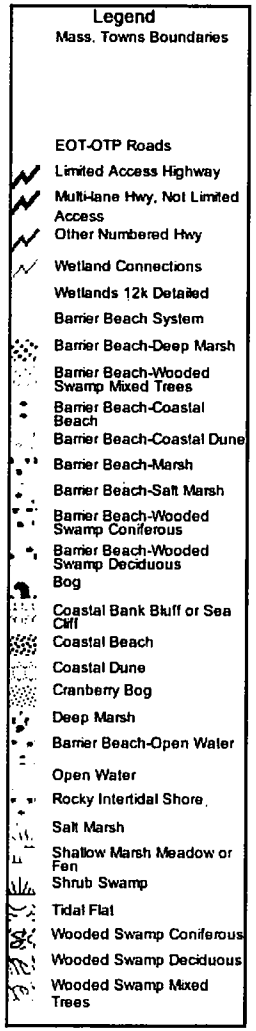
Source: http://maps.live.com/?vendor=google&pkw=live_local

Attachment D - Wetlands Map



Source: http://maps.massgis.state.ma.us/WETLANDS12K/viewer.htm

Wetlands Map Legend



Attachment E - Aggregate Industries DMR Results
MA0001830

	Turbidity (NTU)		pH (SU)		TSS (mg/L)		Total Settleable Solids (ml/L)		Flow (MGD)	Total Ammonia & Ammonium (ug/L)
Date	Max Conc	Ave Conc	Max Conc	Min Conc	Max Conc	Ave Conc	Max Conc	Ave Conc	Qty Ave	Ave Conc
31-May-07	9.37	6.45	7.8	7.5	21	8.25	0.1	0.05	0.94	0.12
30-Apr-07	46	17.04	7.7	7.1	23	11.4	0.11	0.1	0.91	0.29
31-Mar-07	20.7	14.6	7.7	7.1	19	10	0.1	0.03	0.94	0.22
28-Feb-07										
31-Jan-07	10.3	7.61	8.1	7.6	8	4	0	0	0.94	0.12
31-Dec-06										
30-Nov-06	6.72	3.64	7.9	7.4	9	4.25	0	0	0.91	0.15
31-Oct-06										
30-Sep-06	3.97	1.77	8	7.3	5	1.25	0	0	0.91	0.17
31-Aug-06	3.41	2.31	8.3	7.8	8	2	0	0	0.94	0.21
31-Jul-06	9.63	6.51	8	6.3	7	1.4	0	0	0.94	0.27
30-Jun-06	8.26	4.22	8	7.3	0	0	0	0	0.91	0.24
31-May-06	49	16.51	8.4	7.4	37	11.6	0	0	0.76	0.59
30-Apr-06	5.78	3.47	8.1	7.5	0	0	0	0	0.69	0.08
31-Mar-06	2.6	2.0225	7.8	7.1	0	0	0	0	0.76	0.4215
28-Feb-06	11.2	8.27	7.6	6.8	8	2	0	0	0.67	0.11
31-Jan-06	9.99	7.406	8.1	7.2	7	0	0	0	0.7	0.12
31-Dec-05	16.3	8.375	7.5	6.8	12	3	0	0	0.73	0.15
30-Nov-05	9.46	3.985	7.7	7.3	0	0	0	0	0.73	0.21375
31-Oct-05	3.95	2.296	8.2	7.1	4	0	0	0	0.72	0.15
30-Sep-05	2.92	1.8775	8.2	8	5	2.25	0	0	0.73	0.9
31-Aug-05	4.28	3.294	8.3	7.2	12	6.6	0	0	0.76	0.1384
31-Jul-05	7.65	3.6825	8.2	7.6	18	5.75	0	0	0.7	0.2
30-Jun-05	2.64	1.865	7.8	7	0	0	0	0	0.73	0.75
31-May-05	3.69	2.454	7.9	7.6	10	7.2	0	0	0.72	0.1338
30-Apr-05	5.81	3.2925	7.7	7.4	15	6	0	0	0.72	0.14
31-Mar-05	10.3	8.01	7.5	7.3	5	2.25	0	0	0.76	0.333
28-Feb-05	13.1	9.17	7.6	7.4	10	3.5	0	0		0.28
31-Jan-05	14.2	7.144	7.4	7.2		1.4	0	0		0
31-Dec-04	8.32	6.6025	8.2	7.5	9	5.75	0	0		0.3
30-Nov-04	1.76	1.416	7.8	7.3	4	1.6	0	0		0.3426
31-Oct-04	2.3	1.445	8.1	7.2	0	0	0	0		0.41
30-Sep-04	2.57	1.9175	8	7.4	11	2.75	0.1	0.03	0.73	0.28
31-Aug-04	4.5	2.698	7.9	7.5	11	3	0	0		0.1108
31-Jul-04	7.33	4.65	7.8	7.6	18	6	0	0		0.28
30-Jun-04	3	2.232	7.7	7.6	5	1	0	0		0.58
31-May-04	6.9	5.4075	7.9	7.3	8	3.5	0	0		0.626
30-Apr-04	37.9	16.565	7.8	7.5	18	8.5	0	0		0.23
31-Mar-04	6.19	4.186	7.9	6.8	6	1.2	0	0		0.075
29-Feb-04										
31-Jan-04	5.74	3.095	7.7	7.5	5	2.5	0	0		0
31-Dec-03										
30-Nov-03	2.21	1.93	7.8	7.6	10	2.5	0	0		0
30-Sep-03	3.8	2.01	8	7.1	5	2	0	0		0
31-Aug-03	4.72	2.76	7.9	7.4	5	2.25	0	0		0.1
30-Jul-03	2.5	1.61	8	7.6	9	4	0	0		0.25
30-Jun-03	3.36	2.2	7.9	7.5	6	1.2	0	0		15.4
31-May-03	9.17	4.01	7.9	7.3	0	0	0	0		0.17
30-Apr-03	14.7	5.44	7.9	7.1	9	3.25	0	0		0
31-Mar-03	4.62	1.23	7.9	7.4	0	0	0	0		0
28-Feb-03	7.52	4.19	7.9	7.7	5	2.5	0	0		0
31-Jan-03	3.49	2.14	7.9	7.5	0	0	0	0		0.09
31-Dec-02	11.5	4.83	7.8	7.1	11	2.75	0	0		0.1
30-Nov-02	8.64	4.86	7.7	7.1	65	18.25	0	0		0.03
30-Sep-02	2.59	1.24	8.1	7.5	4	1.8	0	0		0.14
31-Aug-02	2.15	1.39	8.3	7.4	4	0.8	0	0		0.21
31-Jul-02	3.7	1.42	7.9	7.6	4	0.8	0	0		0.18
30-Jun-02	2.78	1.43	7.8	7.5	0	0	0	0		0.11
31-May-02	0.089	5.52	8.2	7.5	7	1.75	0	0		0.08
30-Apr-02							0	0		
31-Mar-02	2.58	1.76	7.8	6.9	0	0	0	0		0.05
28-Feb-02	2.43	2.43	7.9	7.9	0	0	0	0		0.27
31-Jan-02	11.5	4.412	7.9	7.4	9	3.2	0	0		0.3296
31-Dec-01	0.61	2.89	8	7.9	4	0.8	0	0		0.34
30-Nov-01	3.24	1.59	8	7.4	0	0	0	0		0.18
31-Oct-01	4.72	1.78	8	7.9	7	1.4	0	0		0.09
30-Sep-01	2.6	2.33	8.6		6	1.5	0	0		0.13
31-Aug-01	4.89	4.32	8.2	7.8	11.1	7.78	0	0		0.23
31-Jul-01	5.81	5.68	8.4	7.7	16	12	0	0		0.07
30-Jun-01	18.9	9.4	7.9	7.8	55	17.75	0	0.1		0.08
31-May-01	8.39	5.316	8.2	8	7	6.8	0	0		3.1342
30-Apr-01	25.5	7.2	7.9	7.8	31	25	0	0	0.41	0.201
31-Mar-01	24	21.2	7.8	7	16	16	0	0	0.38	0.33
28-Feb-01	19.8	17.15	7.8	7.7	13	9.63	0.1	0.03	1.1	0.73
31-Jan-01	17.5	14.05	7.8	7.6	14	11.75	0	0		0.22
31-Dec-00	17.2	13.13	7.9	7.6	37	16.5	0	0		0.272
30-Nov-00	8.4	6.21	7.9	7.8	9	6.33	0	0		0.33
31-Oct-00	9	6.68	7.9	7.4	8	6.2	0	0		0.046
30-Sep-00	10.4	9.03	8.1	7.2	11	8.25	*	*		0
31-Aug-00	30.9	14.3	7.8	6.1	24	11.8	0	0		0
31-Jul-00	14.1	9.8	6.6	6.1	21	18.7	0.1	0.03	3.1	0
	Turbidity (NTU)		pH		TSS		Settleable Solids		Flow	Total Ammonia & Ammonium
AVERAGE	9.437	5.551	7.9	7.370	10.555	4.735	0.008	0.0049333	0.860	0.448
MAXIMUM	49	21.2	8.6	8	65	25	0.11	0.1	3.1	15.4
MINIMUM	0.089	1.23	6.6	6.1	0	0	0	0	0.38	0
measurement	max daily	ave month	range		max daily	ave month	max daily	ave month	ave month	ave month
Previous limits	25	8	8.3	6.5	45	25	report	report	report	report
# exceedences	5	16	3	3	2	0	N/A	N/A	N/A	N/A

* The outlier of 697 mL/L settleable solids, measured on September 30, 2000, was removed from this analysis.

Attachment F

pH-Dependent Values of the CMC (Acute Criterion)

CMC, mg N/L		
pH	Salmonids Present	Salmonids Absent
6.5	32.6	48.8
6.6	31.3	46.8
6.7	29.8	44.6
6.8	28.1	42.0
6.9	26.2	39.1
7.0	24.1	36.1
7.1	22.0	32.8
7.2	19.7	29.5
7.3	17.5	26.2
7.4	15.4	23.0
7.5	13.3	19.9
7.6	11.4	17.0
7.7	9.65	14.4
7.8	8.11	12.1
7.9	6.77	10.1
8.0	5.62	8.40
8.1	4.64	6.95
8.2	3.83	5.72
8.3	3.15	4.71
8.4	2.59	3.88
8.5	2.14	3.20
8.6	1.77	2.65
8.7	1.47	2.20
8.8	1.23	1.84
8.9	1.04	1.56
9.0	0.885	1.32

Attachment G

Temperature and pH-Dependent Values of the CCC (Chronic Criterion) for Fish Early Life Stages Present

CCC for Fish Early Life Stages Present, mg N/L										
pH	Temperature, C									
	0	14	16	18	20	22	24	26	28	30
6.5	6.67	6.67	6.06	5.33	4.68	4.12	3.62	3.18	2.80	2.46
6.6	6.57	6.57	5.97	5.25	4.61	4.05	3.56	3.13	2.75	2.42
6.7	6.44	6.44	5.86	5.15	4.52	3.98	3.50	3.07	2.70	2.37
6.8	6.29	6.29	5.72	5.03	4.42	3.89	3.42	3.00	2.64	2.32
6.9	6.12	6.12	5.56	4.89	4.30	3.78	3.32	2.92	2.57	2.25
7.0	5.91	5.91	5.37	4.72	4.15	3.65	3.21	2.82	2.48	2.18
7.1	5.67	5.67	5.15	4.53	3.98	3.50	3.08	2.70	2.38	2.09
7.2	5.39	5.39	4.90	4.31	3.78	3.33	2.92	2.57	2.26	1.99
7.3	5.08	5.08	4.61	4.06	3.57	3.13	2.76	2.42	2.13	1.87
7.4	4.73	4.73	4.30	3.78	3.32	2.92	2.57	2.26	1.98	1.74
7.5	4.36	4.36	3.97	3.49	3.06	2.69	2.37	2.08	1.83	1.61
7.6	3.98	3.98	3.61	3.18	2.79	2.45	2.16	1.90	1.67	1.47
7.7	3.58	3.58	3.25	2.86	2.51	2.21	1.94	1.71	1.50	1.32
7.8	3.18	3.18	2.89	2.54	2.23	1.96	1.73	1.52	1.33	1.17
7.9	2.80	2.80	2.54	2.24	1.96	1.73	1.52	1.33	1.17	1.03
8.0	2.43	2.43	2.21	1.94	1.71	1.50	1.32	1.16	1.02	0.897
8.1	2.10	2.10	1.91	1.68	1.47	1.29	1.14	1.00	0.879	0.773
8.2	1.79	1.79	1.63	1.43	1.26	1.11	0.973	0.855	0.752	0.661
8.3	1.52	1.52	1.39	1.22	1.07	0.941	0.827	0.727	0.639	0.562
8.4	1.29	1.29	1.17	1.03	0.906	0.796	0.700	0.615	0.541	0.475
8.5	1.09	1.09	0.990	0.870	0.765	0.672	0.591	0.520	0.457	0.401
8.6	0.920	0.920	0.836	0.735	0.646	0.568	0.499	0.439	0.386	0.339
8.7	0.778	0.778	0.707	0.622	0.547	0.480	0.422	0.371	0.326	0.287
8.8	0.661	0.661	0.601	0.528	0.464	0.408	0.359	0.315	0.277	0.244
8.9	0.565	0.565	0.513	0.451	0.397	0.349	0.306	0.269	0.237	0.208
9.0	0.486	0.486	0.442	0.389	0.342	0.300	0.264	0.232	0.204	0.179

Attachment H

Summary of Essential Fish Habitat (EFH) Designation

10' x 10' Square Coordinates:

Boundary	North	East	South	West
Coordinate	42° 30.0' N	70° 50.0' W	42° 20.0' N	71° 00.0' W

Square Description (i.e. habitat, landmarks, coastline markers): Waters within the Atlantic Ocean within Massachusetts Bay within the square affecting the following: from Winthrop, MA to Marblehead Neck, including those waters surrounding inner Marblehead Harbor, Deer Island, The Brewsters, Graves Island, Nahant, MA., Nahant Bay, Broad Sound, Revere, MA., Lynn, MA., Revere Beach, Littles Point, Phillips Point, Saugus River, and Pines River. Other features affected include: Tinkers I., Flying Pt. on Marblehead Neck, Ram I., Southwest Breakers, Outer Breakers, Great Pig Rocks, Off Rock, Dread Ledge, Lincoln House Pt., Long Beach, Little Nahant, MA., Egg Rock, East Pt. and Bass Pt. on Nahant, MA., Lynn Harbor, Point of Pines, Belle Isle Inlet, Crescent Beach, Beachmont, Winthrop Highlands, Grovers Cliff, Snake I., Finns Ledge, Boston North Channel, Calf I., Boston Ledge, Martin Ledge, Three and One Half Fathom Ledge, Roaring Bulls, The Graves, Shag Rocks, Flip Rock, Bass Rock, President Roads, and Green I.

Species	Eggs	Larvae	Juveniles	Adults
Atlantic cod *(Gadus morhua)*	X	X	X	X
haddock *(Melanogrammus aeglefinus)*	X	X		
pollock *(Pollachius virens)*	X	X	X	X
whiting *(Merluccius bilinearis)*	X	X	X	X
offshore hake *(Merluccius albidus)*				
red hake *(Urophycis chuss)*	X	X	X	X
white hake *(Urophycis tenuis)*	X	X	X	X
redfish *(Sebastes fasciatus)*	n/a			
witch flounder *(Glyptocephalus cynoglossus)*				
winter flounder *(Pleuronectes americanus)*	X	X	X	X
yellowtail flounder *(Pleuronectes ferruginea)*	X	X	X	X
windowpane flounder *(Scopthalmus aquosus)*	X	X	X	X
American plaice *(Hippoglossoides platessoides)*	X	X	X	X

ocean pout *(Macrozoarces americanus)*	X	X	X	X
Atlantic halibut *(Hippoglossus hippoglossus)*	X	X	X	X
Atlantic sea scallop *(Placopecten magellanicus)*	X	X	X	X
Atlantic sea herring *(Clupea harengus)*		X	X	X
monkfish *(Lophius americanus)*				
bluefish *(Pomatomus saltatrix)*			X	X
long finned squid *(Loligo pealei)*	n/a	n/a	X	X
short finned squid *(Illex illecebrosus)*	n/a	n/a	X	X
Atlantic butterfish *(Peprilus triacanthus)*	X	X	X	X
Atlantic mackerel *(Scomber scombrus)*	X	X	X	X
summer flounder *(Paralicthys dentatus)*				X
scup *(Stenotomus chrysops)*	n/a	n/a	X	X
black sea bass *(Centropristus striata)*	n/a			X
surf clam *(Spisula solidissima)*	n/a	n/a	X	X
ocean quahog *(Artica islandica)*	n/a	n/a		
spiny dogfish *(Squalus acanthias)*	n/a	n/a		
tilefish *(Lopholatilus chamaeleonticeps)*				
bluefin tuna *(Thunnus thynnus)*			X	X